



THE B.E.S.T. STANDARDS

Benchmarks for Excellent Student Thinking



Algebra 1

Sample Test Materials

The purpose of these sample test materials is to orient teachers and students to the types of paper-based B.E.S.T. Algebra 1 questions. By using these materials, students will become familiar with the types of items and response formats they may see on a paper-based test. The sample items and answers are not intended to demonstrate the length of the actual test, nor should student responses be used as an indicator of student performance on the actual test. The sample test materials are not intended to guide classroom instruction.

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Directions for Completing the Response Grids

1. Work the problem and find an answer.
2. Write your answer in the answer boxes at the top of the grid.
 - Write your answer with the first digit in the left answer box OR with the last digit in the right answer box.
 - Write only one digit or symbol in each answer box. Do NOT leave a blank answer box in the middle of an answer.
 - Be sure to write a decimal point, negative sign, or fraction bar in the answer box if it is a part of the answer.
3. Fill in a bubble under each box in which you wrote your answer.
 - Fill in one and ONLY one bubble for each answer box. Do NOT fill in a bubble under an unused answer box.
 - Fill in each bubble by making a solid mark that completely fills the circle.
 - You MUST fill in the bubbles accurately to receive credit for your answer.

-	-	-	-	-	-	-	-
/	/	/	/	/	/	/	/
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0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9

} Answer boxes
} Negative sign
} Fraction bar
} Decimal point
} Number bubbles

When a percent is required to answer a question, do NOT convert the percent to its decimal or fractional equivalent. Grid in the percent value without the % symbol. Do the same with dollar amounts.

-	1	1				
⊖	⊖	⊖	⊖	⊖	⊖	⊖
/	/	/	/	/	/	/
⊙	⊙	⊙	⊙	⊙	⊙	⊙
0	0	0	0	0	0	0
1	●	●	1	1	1	1
2	2	2	2	2	2	2
3	3	3	3	3	3	3
4	4	4	4	4	4	4
5	5	5	5	5	5	5
6	6	6	6	6	6	6
7	7	7	7	7	7	7
8	8	8	8	8	8	8
9	9	9	9	9	9	9

		-	6	.	7	8
⊖	⊖	●	⊖	⊖	⊖	⊖
/	/	/	/	/	/	/
⊙	⊙	⊙	⊙	●	⊙	⊙
0	0	0	0	0	0	0
1	1	1	1	1	1	1
2	2	2	2	2	2	2
3	3	3	3	3	3	3
4	4	4	4	4	4	4
5	5	5	5	5	5	5
6	6	6	●	6	6	6
7	7	7	7	7	●	7
8	8	8	8	8	8	●
9	9	9	9	9	9	9

2	5	.	3			
⊖	⊖	⊖	⊖	⊖	⊖	⊖
/	/	/	/	/	/	/
⊙	⊙	●	⊙	⊙	⊙	⊙
0	0	0	0	0	0	0
1	1	1	1	1	1	1
●	2	2	2	2	2	2
3	3	3	●	3	3	3
4	4	4	4	4	4	4
5	●	5	5	5	5	5
6	6	6	6	6	6	6
7	7	7	7	7	7	7
8	8	8	8	8	8	8
9	9	9	9	9	9	9

				1	3	6
⊖	⊖	⊖	⊖	⊖	⊖	⊖
/	/	/	/	/	/	/
⊙	⊙	⊙	⊙	⊙	⊙	⊙
0	0	0	0	0	0	0
1	1	1	1	●	1	1
2	2	2	2	2	2	2
3	3	3	3	3	●	3
4	4	4	4	4	4	4
5	5	5	5	5	5	5
6	6	6	6	6	6	●
7	7	7	7	7	7	7
8	8	8	8	8	8	8
9	9	9	9	9	9	9

Do NOT write a mixed number, such as $13\frac{1}{4}$, in the answer boxes.

Change the mixed number to an equivalent fraction, such as $\frac{53}{4}$, or to an equivalent decimal, such as 13.25. Do not try to fill in $13\frac{1}{4}$, as it would be

read as $\frac{131}{4}$ and would be counted wrong.

CORRECT

INCORRECT

5	3	/	4			
⊖	⊖	⊖	⊖	⊖	⊖	⊖
/	●	/	/	/	/	/
⊙	⊙	⊙	⊙	⊙	⊙	⊙
0	0	0	0	0	0	0
1	1	1	1	1	1	1
2	2	2	2	2	2	2
3	●	3	3	3	3	3
4	4	4	●	4	4	4
●	5	5	5	5	5	5
6	6	6	6	6	6	6
7	7	7	7	7	7	7
8	8	8	8	8	8	8
9	9	9	9	9	9	9

OR

1	3	.	2	5		
⊖	⊖	⊖	⊖	⊖	⊖	⊖
/	/	/	/	/	/	/
⊙	⊙	●	⊙	⊙	⊙	⊙
0	0	0	0	0	0	0
●	1	1	1	1	1	1
2	2	2	●	2	2	2
3	●	3	3	3	3	3
4	4	4	4	4	4	4
5	5	5	5	●	5	5
6	6	6	6	6	6	6
7	7	7	7	7	7	7
8	8	8	8	8	8	8
9	9	9	9	9	9	9

1	3	1	/	4		
⊖	⊖	⊖	⊖	⊖	⊖	⊖
/	/	●	/	/	/	/
⊙	⊙	⊙	⊙	⊙	⊙	⊙
0	0	0	0	0	0	0
●	1	●	1	1	1	1
2	2	2	2	2	2	2
3	●	3	3	3	3	3
4	4	4	●	4	4	4
5	5	5	5	5	5	5
6	6	6	6	6	6	6
7	7	7	7	7	7	7
8	8	8	8	8	8	8
9	9	9	9	9	9	9

B.E.S.T. Algebra 1 EOC Mathematics Reference Sheet

Customary Conversions

1 foot = 12 inches
 1 yard = 3 feet
 1 mile = 5,280 feet
 1 mile = 1,760 yards

1 cup = 8 fluid ounces
 1 pint = 2 cups
 1 quart = 2 pints
 1 gallon = 4 quarts

1 pound = 16 ounces
 1 ton = 2,000 pounds

Metric Conversions

1 meter = 100 centimeters
 1 meter = 1000 millimeters
 1 kilometer = 1000 meters
 1 liter = 1000 milliliters

1 gram = 1000 milligrams
 1 kilogram = 1000 grams

Time Conversions

1 minute = 60 seconds
 1 hour = 60 minutes
 1 day = 24 hours
 1 year = 365 days
 1 year = 52 weeks

Formulas

Forms of Linear Equations	Forms of Quadratic Functions	Forms of Exponential Functions
$y = mx + b$ $Ax + By = C$ $y - y_1 = m(x - x_1)$	$f(x) = ax^2 + bx + c$ $f(x) = a(x - h)^2 + k$ $f(x) = a(x - p)(x - q)$	$f(x) = ab^x$ $f(x) = a(1 \pm r)^x$

Quadratic Formula

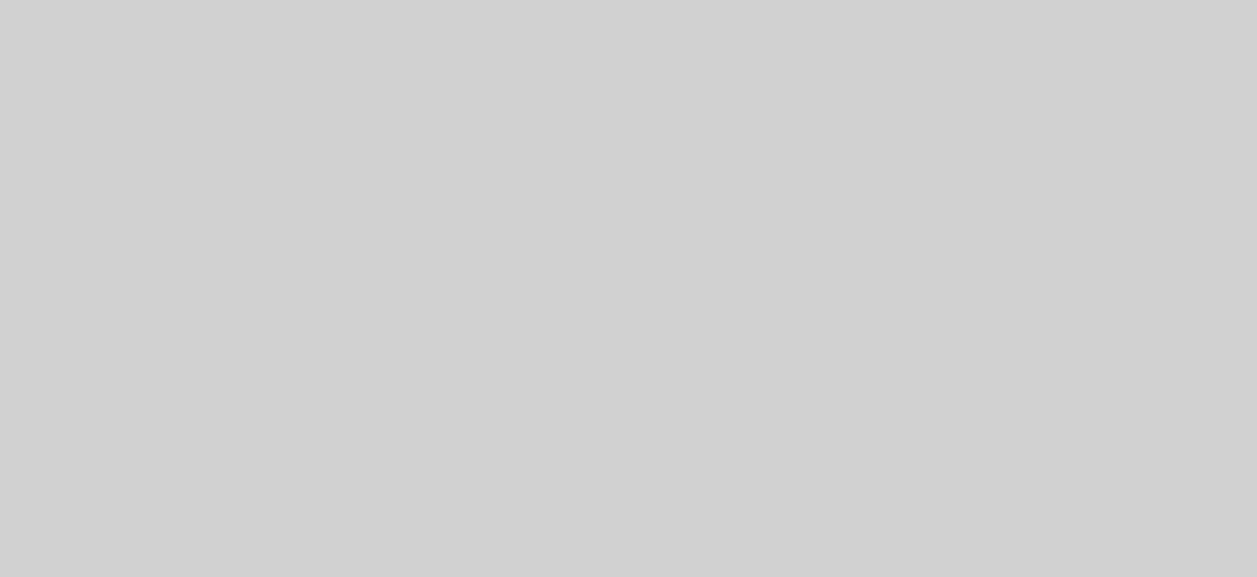
$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

where $ax^2 + bx + c = 0$ and $a \neq 0$

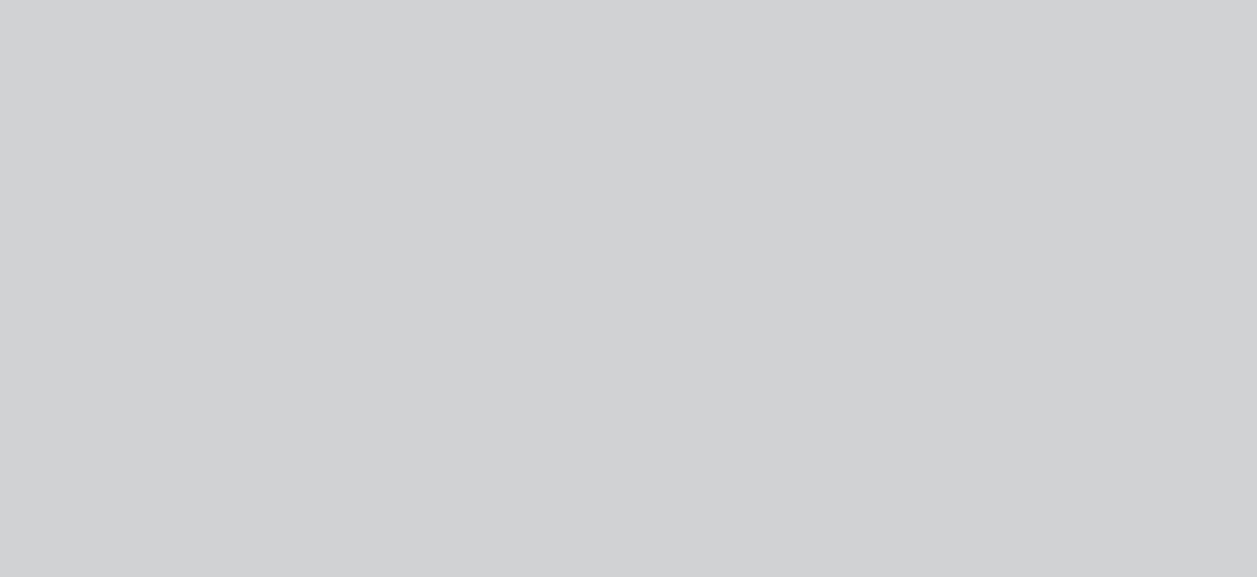
Final Amounts under Simple Interest	Final Amounts under Compound Interest
$A = P(1 + rt)$ where P = principal, r = rate, and t = time	$A = P\left(1 + \frac{r}{n}\right)^{nt}$ where P = principal, r = rate, n = number of times compounded, and t = time

DO NOT REMOVE THIS SHEET

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Segment 1



Use the space in this Test and Answer Book to do your work. Then, completely fill in the bubble beside the answer you choose. For some items, filling in more than one bubble may be required. For items with response grids, follow the Directions for Completing the Response Grids on pages 3 and 4. If you change your answer, be sure to erase completely.

1. A band sells x premium tickets and y regular tickets for a concert.

- A premium ticket costs \$20.
- A regular ticket costs \$5 less than a premium ticket.
- The band raises \$2145 from selling tickets.

Select coefficients to complete the equation representing the relationship between x and y . For each box, fill in the bubble before the number that is correct.

<input type="radio"/> (A) 5 <input type="radio"/> (B) 15 <input type="radio"/> (C) 20 <input type="radio"/> (D) 25	$x +$	<input type="radio"/> (A) 5 <input type="radio"/> (B) 15 <input type="radio"/> (C) 20 <input type="radio"/> (D) 25	$y = 2145$
---	-------	---	------------

2. A function is shown.

$$f(x) = 2x + 1$$

Select all the effects on the graph of the function when $f(x)$ is multiplied by 3.

- Ⓐ The x -intercept increases. Ⓒ The y -intercept increases. Ⓔ The slope increases.
- Ⓑ The x -intercept decreases. Ⓓ The y -intercept decreases. Ⓕ The slope decreases.

Segment 1

B.E.S.T. Mathematics Sample Items

3. The expression $15,000(1 + 0.02)^m$ can be used to model the sales, in dollars, of a company after m months.

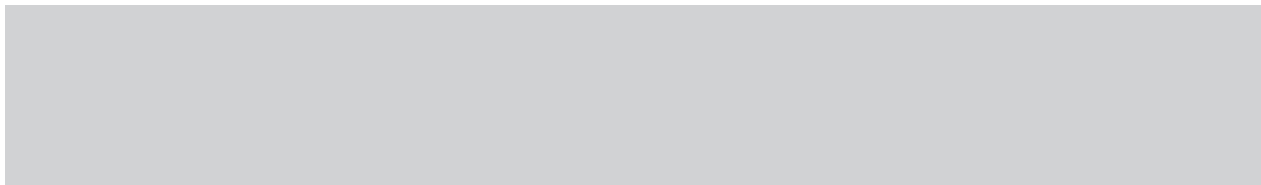
The value 12 was substituted for m to create the expression $15,000(1 + 0.02)^{12}$.

Complete the response grid to enter a number and fill in the bubble before the correct unit to complete the sentence.

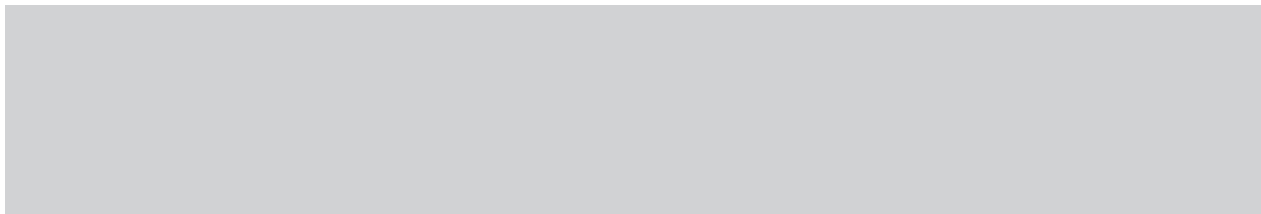
The expression $(1 + 0.02)^{12}$ represents the growth factor of the company's sales for a period of time lasting

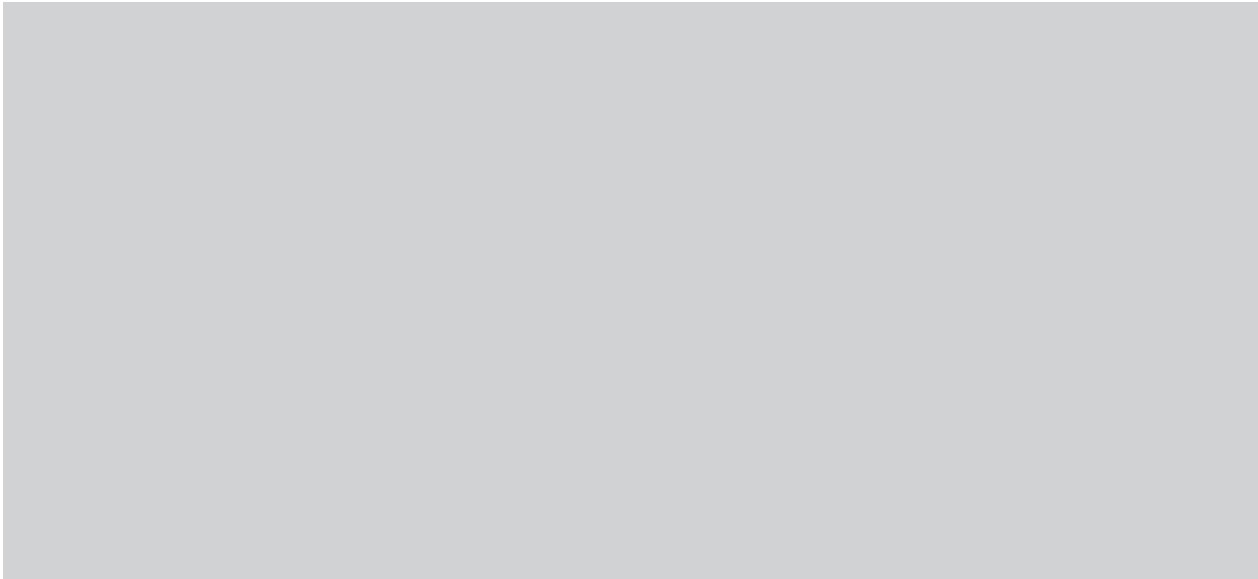
⊖	⊖	⊖	⊖	⊖	⊖	⊖	⊖
/	/	/	/	/	/	/	/
•	•	•	•	•	•	•	•
0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9

- (A) day(s)
- (B) month(s)
- (C) year(s)

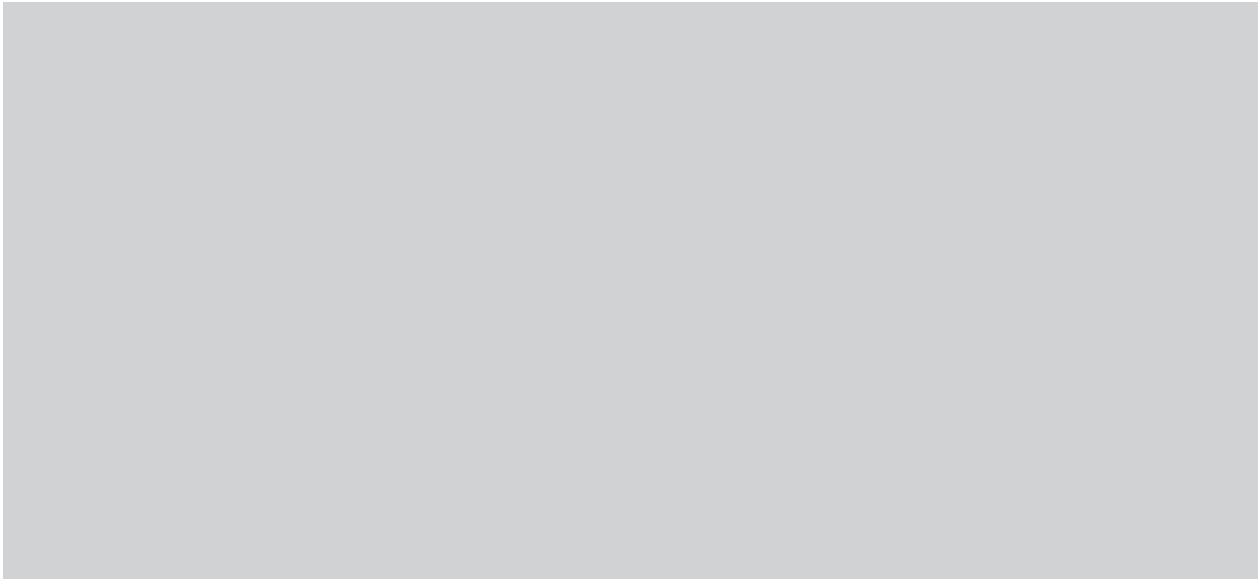


This is the end of Segment 1.





Segment 2



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DO NOT REMOVE THIS SHEET

4. A table of values for a linear function is shown.

x	$f(x)$
-1	-8
3	0
6	6

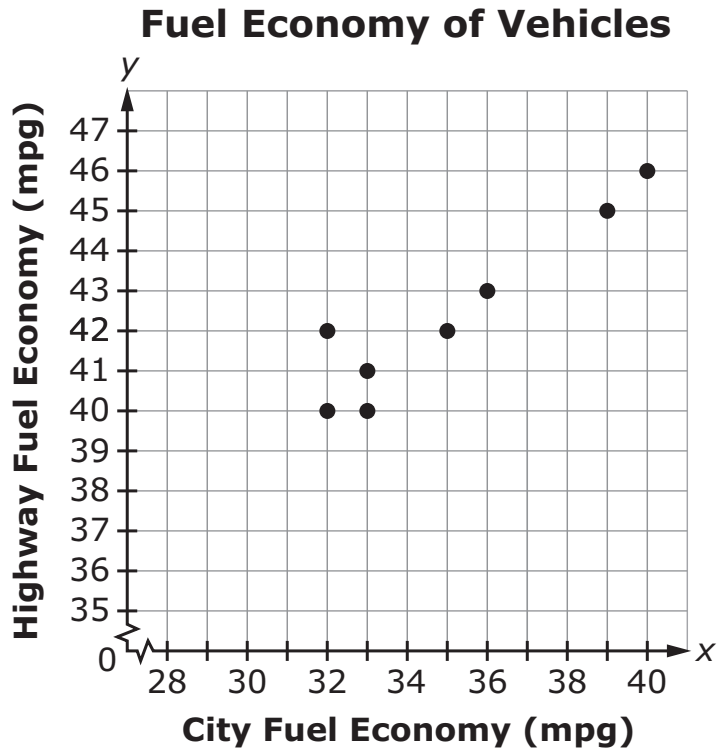
Fill in bubbles to match each key feature of the graph to its value.

	-6	$\frac{1}{2}$	2	3	6
x-intercept	(A)	(B)	(C)	(D)	(E)
y-intercept	(F)	(G)	(H)	(I)	(J)
rate of change	(K)	(L)	(M)	(N)	(O)

GO ON
TO THE
NEXT PAGE.



5. The fuel economy of a car is its average distance traveled per amount of fuel consumed. Cars have different fuel economies when they are driven in the city and on the highway. A linear model of the relationship between the city and highway fuel economies of eight cars, in miles per gallon (mpg), is shown.



This question has **two** parts.

Part A

Which linear equation best models the scatter plot?

- (A) $y = \frac{2}{3}x + 19$
- (B) $y = \frac{6}{8}x + 25$
- (C) $y = \frac{3}{2}x + 19$
- (D) $y = \frac{8}{6}x + 25$

Part B

Based on the model in Part A, what could be the highway fuel economy, in mpg, of a car that has a city fuel economy of 43 mpg? Round your answer to the nearest hundredth.

⊖	⊖	⊖	⊖	⊖	⊖	⊖	⊖
	⊘	⊘	⊘	⊘	⊘	⊘	
⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9

6. The table shown represents two functions, Function A and Function B.

x	Function A	Function B
0	700	600
1	750	624
10	1200	888*
20	1700	1315*

*rounded value

Complete the sentences to compare the two functions. For each blank, fill in the bubble **before** the word or phrase that is correct.

Function A appears to grow _____ [linearly exponentially].

Function B appears to grow _____ [linearly exponentially].

As x increases, the quantities for _____ [Function A Function B]

will eventually exceed the quantities for _____ [Function A

Function B].

7. In a survey of 3,260 people, 57% of people said they spend more than 2 hours a day on their smartphones. The margin of error is $\pm 2.2\%$. The survey is used to estimate the number of people in a town of 17,247 who spend more than 2 hours a day on their smartphones.

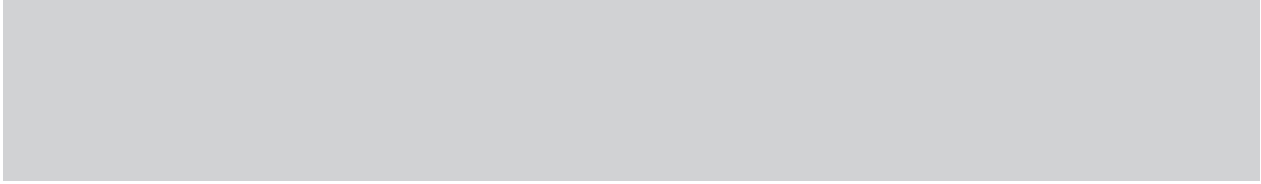
Based on the survey, what are the estimated minimum and maximum numbers of people in the town who spend more than 2 hours a day on their smartphones? Round your answers to the nearest whole numbers.

Minimum:

-	-	-	-	-	-	-	-
/	/	/	/	/	/	/	/
.
0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9

Maximum:

-	-	-	-	-	-	-	-
/	/	/	/	/	/	/	/
.
0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9



This is the end of Segment 2.



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